A CHRISTIAN APPROACH TO TEACHING ECOLOGY . . . OR IS IT ENVIRONMENTAL SCIENCE?

The student assembly speaker, representing a major multinational manufacturer, spoke about business ethics and employee relations: "Every person is important," she said. "You can learn from everyone. . . This requires humility."

My ecology class followed the assembly. Entering the room, I remarked: "That was a good talk about ecology." Heather looked puzzled. She might as well have asked, "What are you talking about?"

I pushed the opportunity, asking, "What is ecology?" The answer may appear obvious, but students frequently do not know it. In a perverse way, I welcome the mistake; it gives me an opportunity to explore facets of the subject that are often omitted from ecology courses.

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The author and his students do ecological field studies in the Colorado Rockies.

BY HENRY ZUILL

Defining Ecology

What is ecology? Why the confusion? In answering, I give the definition, but also trace why confusion exists. In doing so, I try to relate ecology to its place in the whole scheme of things.

Students often think that ecology is the study of the environment. That is partially true, but in reality, ecology is concerned with how organisms *interact* with their environments. To only say ecology studies the environment, with

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In reality, no relationships exist outside the domain of ecology. For reasons concerned with convenience, and possibly with misunderstanding of our place in nature, human relationships are usually excluded. However, humans are an essential part of ecology.

Ecology is not an old science. Ancients understood some aspects of it, but as a formal discipline, it is only about 150 years old. Ernst Haeckel, a German zoologist, coined the term in the 1860s as he sought support for natural selection and evolution.[1]

Ironically, ecology actually poses a major challenge to evolution. How, for example, did vital ecological relationships begin? The usual answer is coevolution, but this, by definition, requires already existing ecological relationships. So, if evolution has no answer, with what are we left? Creation?

Changed Understanding of Ecology

In the 1970s, the word *ecology* became associated with environmentalism or environmental science. This connection continues today.

Ecology and environmental science are not the same, but the ecology professor might as well include environmental science with the usual course materials. Otherwise, he or she will have to engage in needless battles. Moreover, many textbooks combine the two areas.

Environmental science is multidisciplinary. It includes ecology, in the purest sense, but more broadly, it studies how business, economics, philosophy, ethics, politics, public policy, law, and even theology relate to our use and abuse of the environment. Thus, it goes far beyond conventional definitions. Some may resent the inclusion of these other areas, but they bring the human influence back into ecology and make ecology whole.

Christian Environmentalism?

Several years ago in Colorado Springs, Colorado, I looked unsuccessfully in a Christian bookstore for a book on Christian environmentalism. I was disappointed, but not surprised. My reading had led me to expect this. There are books on environmentalism by Christian authors, but this store carried none of them. I have found this same situation elsewhere. Why is there such indifference? In teaching ecology, I discuss this with my students.

Rachel Carson's 1962 book, *Silent Spring*,[2] served as the catalyst for the environmental movement. By the 1970s, much public excitement had been generated and widespread efforts to clean up and preserve the environments were underway. Laws were passed, government agencies established, and people were willing to forgo some conveniences for the common good. Strangely, Christians scarcely noticed, judging by the few works written on the subject from a religious perspective.[3]

In 1967, UCLA professor Lynn White published at paper entitled, "The Historical Roots of Our Ecologic Crisis."[4] It focused on our Judeo-Christian heritage as the cause of the ecological crisis. The problem, as White saw it, was our understanding of biblical texts about human dominion over nature. White looked for a new doctrinal synthesis that included caring for the environment.

White's accusations stimulated heated reactions. Christian writers, who had been silent on the subject before, took up their pens with a vengeance. Suddenly, a din of voices were eager to be heard. To some extent, this is still

true 30 years later.[5]

Many writers acknowledged White's main allegation, admitting that Christians had misunderstood *dominion*. One writer suggested that filling and subduing the earth, in the context of having dominion, can be understood by visualizing the newly created earth as not having been full.[6] Dominion, a natural response of creatures, was not what human beings required, but what they already possessed.[7] Because of sin, however, this relationship was replaced by fear.[8] In describing the glorious new earth, Ellen White supports the idea of filling the earth after Creation, when she said that the garden, "untouched by the curse of sin," will be "a sample of what the whole earth *would have become* had man but fulfilled the Creator's glorious plan."[9]

Sadly, despite some positive beginnings, most believers' reactions to environmentalism remain ambiguous, at best. Why? What happened?

In the early 1970s, James Lovelock began promoting an idea that affected Christians' ideas about environmentalism. A British atmospheric scientist, Lovelock was asked by the American National Aeronautics and Space Administration to investigate the possibility of life on Mars. By studying its atmosphere, which is very different from Earth's, he concluded that the Red Planet was lifeless. But then he began to wonder about the differences. Lovelock concluded that Earth's evolving flora and fauna made our atmosphere unique.[10] Natural selection theory suggests that environments select suitable gene combinations and thereby shape organisms. Lovelock suggested that organisms also shape environments to suit the needs of living things. Accordingly, all living things work together in a global feedback system to keep Earth's atmosphere, climate, ocean chemistry, and soils in a balance suitable for life. The idea of living processes regulating the physical environment (global homeostasis) has been widely accepted, although aspects of Lovelock's ideas have not been as favorably received.[11] Lovelock saw the Earth as a superorganism with individual parts. Although we would reject evolutionary extremes and the "superorganism" paradigm, it is difficult not to accept an integrated global ecological feedback system.

Lovelock explained his idea to novelist William Golding. Golding, fascinated, proposed a name that Lovelock accepted—Gaia, Greek goddess of Earth. This name became attached to the hypothesis jointly put forward by Lovelock and Lynn Margulis, an American microbiologist.

This personification of Earth changed everything, carrying the idea way beyond what Lovelock and Margulis had imagined possible. New Agers adopted the "goddess," embellishing her with pagan trappings. Naturally, if Earth (Gaia) was vulnerable, she needed protection. New Agers promptly became environmentalists.

Thus, just as Christian writers were feeling positive about environmentalism, along came the New Age-Gaia association, which derailed many believers, causing them to reject environmentalism as pagan. Many have gone back to the old misinterpretation of dominion and even assert that they not only have rights over nature, but also that dominion is a mandate that humans are required to exercise.

Consequently, Christians have difficulty relating to environmentalism. Intuitively, they may feel that they should protect the environment, but they think doing so is pagan. Moreover, many believe physical life is evil; it is the next life, to which our departed disembodied spirits ascend, that is important. This dualistic view, a Gnostic way of thinking inherited from ancient Greeks, permeates Christian doctrine to this day, and devalues creation.[12] Thus, believers may simultaneously be zealous creationists and plunderers of creation.

Even we who think wholistically are not immune to misunderstanding. We may think that, since the world will be destroyed, environmentalism is irrelevant. John the Revelator, however, warns about the destruction of those who destroy the earth.[13] Christians must care for creation; it nurtures us as the Creator intended, points to Him, and teaches spiritual lessons.

Ecological Integration

Ecology students must see ecology in terms of integration. While studying the parts of the ecosystem, they must recognize that the whole is more than the sum of its parts. Students must see ecology in terms of relationships and integration. Ecological relationships include complex, overlapping functions of multiple species that are not evident from studying only their parts.

We may destroy some ecosystem components without the whole unraveling, but only because there is functional redundancy among species. Each species embodies a unique set of functions, many of which overlap the functions of other species.[14] These make ecosystems resilient. However, the more we destroy, the more we reduce functional stability.

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Awaiting the chipmunks. . .

Therefore, each species is important.

This idea should make us pause before damaging nature. Although our actions may seem innocent, they are not innocuous. It behooves us, therefore, to correct the damage when we can. One way to do this is to live simply. If students learn this, they will have learned well. However, Gene Johnson points out that "you must first give people an 'alternative path' to happiness before you start talking about voluntary simplicity." He points to Jesus' advice to seek first God's kingdom.[15]

Paul describes the essentials of human ecology: "For our rejoicing is this, the testimony of our conscience, that in simplicity and godly sincerity, not with fleshly wisdom, but by the grace of God, we have had our conversation in the world."[16] When we live like this, the environment gains. Paul also helps us see the ecological benefits in living this way: "For the creation waits with eager longing for the revealing of the sons of God. . .because the creation itself will be set free from its bondage to decay and obtain the glorious liberty of the children of God."[17] While this refers to ultimate restoration, nature will benefit now if we recover original relationships.

Human Ecology

The term "human ecology" is often used synonymously with *environmentalism*. Here, we may emphasize ways in which humans harm nature and what must be done to correct the damage. However, "human ecology" also needs a positive focus. It must include the benefits derived from nature as well.

There is increasing evidence that people benefit from nature—physically, spiritually, and emotionally. Recently, returning from a field lab, I listened to a broadcast discussing life in two Chicago housing projects.[18] In one complex, there were trees and a park-like setting. The other was surrounded by pavement and cement. The housing project surrounded by nature had significantly less violence. Evidently, nature has a softening influence.

Hearing this, I was fascinated, and began thinking about other effects of nature. *American Forests*[19] reports that trees make people feel and behave better, be more productive, and less stressed. *The American Journal of Nursing* found that patients recovered more quickly and required fewer pain-killing medications when exposed to a view of a natural out-of-doors setting.[20]

Another study revealed that the appearance of a campus—particularly its trees and flowers—is an important factor for students choosing a college, even more important than brochures and other forms of propaganda. It was only slightly less important than meeting and talking with students from the college.[21] College administrators would do well to keep this in mind when allocating recruiting funds.

Another aspect of human ecology is recognizing that we are part of nature. Ecosystems are interactive entities in which every organism, human beings included, is important. We need each other.

If we understand how ecosystems work, including their human components, we will value each individual—human, plant, and animal. Applying this understanding to all relationships has far-reaching implications for the environment and for human interactions, including national and racial relations, church and institutional administration, government, industry and business, and so on. It will change everything. Contrasted with the "machine model," the "ecosystem model" sees people as valuable, even indispensable.

Recently, *Business Week* printed an editorial entitled: "The Rich Ecosystem of Silicon Valley"[22] (Can we use the term *ecosystem* to describe a business environment? Well, why not!). It points out that "Brains, not brawn are paramount. . . . What college you went to doesn't matter. . . . [In Silicon Valley,] it makes no difference if you're from Buffalo or Bombay." This approaches the ideal where everyone is important. In contrast, "machine models" see people as spare parts.

Years ago, before campuses were computerized, a college was considering purchasing an administrative computer. A committee surveyed the models, but the president believed that the decision would be his alone.

One day, speaking about the computer, he said smugly that he would not consult experts. "They only confuse me," he asserted. "I read for myself, and base my decision on that." When pressed about the matter, however, he admitted he had never touched a computer.

This president was using the "machine model" of administration. He saw the advisory committee as irrelevant. Quite frankly, he did not trust people, and in the end, his office became his fortress.

Ecology, as we have seen, extends beyond the purview of biologists—it is important to everyone. Why should human relations not be seen as an extension of ecology? Since ecology is for everyone, those who are designated to teach it have special opportunities.

The ecosystem model values individuals and teaches trust. In a fallen world, trust may be betrayed. The model then requires forgiveness and rehabilitation,

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The chipmunks have arrived!

taking us back to original relationships when we had close association with the Creator. That becomes our ideal, as made possible by the Holy Spirit.

Suffering in nature must also be considered. An understanding of the plan of salvation helps clarify this puzzle. Moreover, Scripture teaches there is an enemy.[23] While it may not immediately alleviate all pain, the answer God gave in Jesus gives profound hope for future restoration and justice. We believe Jesus created all things and by Him all things, including all creatures, will be brought back into proper relationship with God,[24] and consequently, with one another.

Science may be difficult to integrate with faith,[25] but ecology, as viewed in relationship to environmentalism, may foster a return to a more positive relationship with the Creator. And thereby, faith grows. Thus, humankind and the ecology can experience wholeness again.

Challenges to Teaching Ecology

Teaching ecology is not without challenges. When environmentalism was a driving force in society, students were interested in the subject, but recently that interest has waned.

Increasingly, pressures threaten the liberal arts curricula. Science students want courses perceived as leading to their chosen careers. Premedical students want mini-medical courses, for example. Some professors and students are willing to follow this trend, unmindful of the value of a broad educational base, which integrates knowledge from many apparently disparate disciplines.

Gene Johnson[26] has observed the trend of offering molecular biology at the expense of natural history courses. Students do need to learn about exciting developments in molecular biology. But, in Johnson's words, referring to natural history courses, "they're essential if we're to develop the proper attitude toward the environment."

In teaching ecology, I approach the problem in two ways. The first hurdle is to get students enrolled in the class, so they can glimpse its importance. We offer a trip to a lovely location that, aside from its main purpose, is definitely an inducement to take the course. This early September trip to Colorado's Front Range occurs when aspens are at their peak fall colors. The experience of observing different ecological zones, moreover, provides an unbeatable educational experience.

Environmental science is multidisciplinary.

Another approach is to show that ecology is pertinent to students' career goals. I have students read and discuss several medical ecology papers. Some papers we have discussed are: "Tracking a Killer: Following Cholera With Every Available Means,"[27] "Do Disease Cycles Follow Changes in Weather?"[28] and "The Ecology of Lyme-Disease Risk."[29] These readings help students put ecology in its proper place.

In Conclusion

Ecology, or environmental science, is multidisciplinary. As such, it allows ecology to be integrated with other disciplines. It also allows us to tie it to faith. Much more could be written about teaching ecology, and many approaches can be used. In this discussion, I have shown a few ways we may use ecology to reach an understanding of humanity's relationship with nature, with one another, and above all with the Creator—the whole ecological system. I hope, when their ecology course is over, the students will be able to make the great leap into a thoroughly integrated ecology—with themselves included.

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8. See Genesis 9:2 in which the fear of humanity is placed in animals.

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